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LECTURES ON THE EXPLORATION AND TREATMENT OF DISEASES OF THE CHEST.

Lecture I.—*Uses of Classification in the Study of Disease—Comparison of Physical and General Signs.* By W. W. Gerhard, M. D.

In the study of diseases of the chest, as well as those of other cavities of the body, the classification adopted for the convenience of the pupil must often be arbitrary and imperfect. Diseases which are naturally closely connected together are separated into artificial subdivisions, while others which are essentially dissimilar are brought together in a manner which tends to lead the mind of the pupil from the study of their true relations; still, the artificial divisions which have been admitted for a long time, are in general the most easily recollected, and for purposes of study possess many advantages. While the erroneous conclusions to which an artificial classification sometimes leads may be obviated by attention to real points of similarity, and the natural connexion may finally be re-established after it has been for a time broken up. There is thus a double task for the author or teacher: first, that of analysis, for the purpose of discovering and pointing out isolated facts; next, that of synthesis, or of bringing together those which present, in common, strongly marked fundamental characters. Both of these tasks must be kept in view, or the true scientific connexions of disease may be forgotten, and the diagnosis will be merely local, and therefore imperfect, instead of being based on correct and enlarged data.

The very division of diseases into those belonging to the several cavities of the body, is, in a great degree, artificial; and although many of these affections are strictly local, or nearly so, there are others which are nothing more than evident shoots from a diseased root, which extends itself widely throughout the body. In these cases the disease, when it shows itself in the chest, is readily recognised, and is taken as a sign of the general disorder. Sometimes the local disorder grows rapidly, and becomes the prominent malady; but in all such cases it is only a sign of a deeper and more extended mischief.

The remarks which are applicable to the study of disease, are naturally extended to the means of discovering it. These are separated according to the various methods of investigation resorted to, whether founded on the general symptoms, or the physical changes of the part; and they are more or less deceptive without a careful comparison, or collation of them, one with another. This is not done by a smatterer in pathology or in diagnosis; hence the conclusions attained by him are uncertain, and cast discredit upon medicine, and especially on exact diagnosis. The rules of true philosophy, as applied to medicine, do not differ from those of any other science. The same mental discipline, and the same rules of philosophizing are required; and, with equally ascertained data, the same degree of certainty may be acquired. We must first separate a group of facts into detached elements, examine them in every practicable way, and then bring them together again, and reinstate them in a regular and natural order.

In all departments of science, especially the natural sciences, with which medicine is so closely connected, we examine the objects of our research in two ways: first, as actually existing; and, secondly, as past. The objects actually present, are known by evident signs; those past, are discoverable by the more obscure traces which they have left behind. We thus discern the modes of a disease, just as we learn the habits of a plant or an animal, from its footsteps, or the remains of its food; and we can, in either case, learn the peculiarities which have characterized them during life, or during the continuance of the diseased action, by the phenomena actually occurring, or the changes consequent upon them. We are therefore obliged to discriminate in the study of disease, between those phenomena which are actually going on, and those which have terminated and are no longer of mischief; this obviates many grave errors, and prevents a disorder from being confounded with the lesions which often

constitute the proof of its cessation, or it prevents us from mistaking the actions which are in their nature mischievous for those which are useful and salutary. The latter error is one of more frequent occurrence than the former, for the severe diseased action may require for its removal a slighter, but more permanent deviation from the healthy functions of the part. And although this secondary disorder would, if occurring singly, constitute a disease, it ceases to be one when it is merely a curative agent which exerts a favourable influence with the primary affection. These diseases are often very similar to blisters, or other powerful revulsive means, truly curative, and they then only become injurious when heedlessly meddled with.

The recognition both of the primary and secondary disorders, is more easy in affections of the thorax than in those of other cavities of the body, from our possessing the advantage of two distinct modes of investigation. These are the altered functions, including both those of the viscera of the thorax and of the rest of the body, and the physical signs offered by the diseased organ. The general symptoms of thoracic diseases are learned in the same way as those of other organs of the body; but the physical signs, on the other hand, are so much more applicable to chest affections than to any other disorders, that they are, in practice, with a few exceptions, used only in the diagnosis of the diseases of this cavity, and are generally described with direct reference to the chest. This peculiar fitness of the physical signs for the study of pectoral diseases, depends upon the conformation of the thorax and the structure of the organs contained within it. These are important viscera,—the lungs and heart, which are organs possessing different degrees of density, and constantly in motion; hence we may, from the examination of the thorax, not only ascertain the density of the organs when at rest, but we may, with great certainty, discover whether they act in a regular and natural manner, and what impediments interfere with their motion. These advantages are not offered by the viscera of any other cavity; for although the physical properties of them are sometimes sufficiently marked to enable us to detect variations in form, or in density of tissue, they are never susceptible of sufficient motion to cause an audible sound by their own contraction, or by the passage of a fluid throughout their cavity. The physical signs are, therefore, chiefly adapted to the investigation of the diseases of the thorax.

Physical exploration is much more extended in its application when combined and compared with the rational signs, than if used alone. For in itself it teaches us rather the condition of organs as modified by disease, than the manner in which the disease forms, or the mode in which it advances. This is especially the case in the chronic diseases of the chest, which depend upon a general vice of the economy, for in order to distinguish disease from health, by the physical exploration of the lungs and heart, it is necessary that a change should occur in the structure of the tissue,—and as this alteration is only brought about slowly and gradually, we cannot always decide whether the tissue is or is not diseased to some extent, if it be in a degree not sufficient to produce an important change in the conformation of the part. There is, therefore, no means of arriving to a correct conclusion in the diagnosis of pectoral diseases, other than a union of the two modes of investigation, which will then work together as two different ways of arriving at the same end. When physical exploration is properly understood, and compared with the symptoms, it will be found to be even more useful for its negative than its positive results, that is, it will be more useful as a means of showing that some diseases do not exist, or that a given disease is not arrived at a point of structural disorganization sufficient to endanger life, than as direct evidence of the mischief already done to the organs. The positive evidence derived from physical exploration is so simple and easily discovered, that after acquiring a certain familiarity with it, little attention is required to discover the full value of the signs; the negative evidence, on the other hand, is much more difficult, for a thorough knowledge of the means of examination, and much practice in using them, are required to pronounce with certainty as to the existence of slight alterations of a part, or the absence of decided structural change. But when the necessary familiarity is acquired, the certainty of the knowledge obtained from this source is such, that we may rely upon its negative evidence as confidently as upon its positive signs, especially when compared with the indications derived from the general symptoms.

The great value of the negative evidence of physical exploration depends upon its certainty. The process of reasoning which renders negative evidence of value in diagnosis, is called reasoning by way of exclusion; but, although it is of great utility when skilfully applied, it is useless unless a disease is announced by positive signs when it exists, and then we may look upon the absence of these signs as a proof that it is not present. If, on the other hand, the signs themselves be doubtful, the absence of them is of course no proof that the disease does not exist; or if these signs be of such nature that we can ascertain them with extreme difficulty, they lose the advantages of serving both as negative and positive evidence. Now, in the diseases to which physical exploration is applicable, this is not the case. The signs are, in general, very easily ascertained, and are always, under similar circumstances, the same; hence they may be used in the way of exclusion with great confidence; that is, when they are not discovered by one who is familiar with the means of exploring them, they may be confidently said not to exist. This negative evidence, as I have already stated, is useful in two ways: first, as evidence that there is no disease; secondly, as evidence that there is no great change of structure. The first requires that the general symptoms should agree, as it were, with the physical signs, in proving the integrity, or the comparative soundness of the part. The second requires that the physical signs should be, to a certain extent, contradicted or disproven by the general symptoms. But, as this seeming discrepancy is applicable only to the degree of the alteration, and not to its nature, there is, in fact, no real contradiction between the two means of examination. On the contrary, they will be found, when compared together, to accord singularly in the principal deductions which are drawn from each of them.

The extent of application of the physical means of exploration is, perhaps, novel to many persons who are not familiar with the beautiful application of the laws of diagnosis, by way of exclusion, in which the certainty of the physical signs renders them even more useful, than in other cases in which a precision which approaches mathematical correctness is required; but this very certainty may render them an occasional source of error with those who are neither accustomed to their use, nor perfectly familiar with the ordinary symptoms of disease. That is, an art which is evidently based upon fixed physical laws, may lead to error when the data upon which the problem of diagnosis is founded are not correctly settled, although the process of reasoning may still be the correct one. But, the abuse of a certain method of observation does not constitute a real objection to its employment; it merely proves that it is necessary to surmount the first difficulties which attend its acquisition.

The great importance of the comparison of the general symptoms and physical signs has become more apparent with the more general employment of physical exploration, as a really practical aid to diagnosis. The earlier writers on auscultation, especially Laennec, were rather disposed to separate physical from symptomatic diagnosis: this error depended upon the novelty of the art, and the overstrained efforts to extend its application,—but as physicians became more familiar with it, and had opportunities for testing its merits, it was placed on its real footing, and regarded as the most useful of all symptoms taken singly, but as neither the only class of symptoms to be relied upon, nor as superseding the general signs. We are indebted to the French pathologists for pointing out the necessity of comparison of all the symptoms of pulmonary disease, and of connecting this comparison with their succession or order. It is a subject largely insisted upon in the writings of Andral, but one which was most completely developed in the lectures of Dr. Louis. It afterwards received much attention from Dr. Stokes, and others, who have occupied themselves with the study of pectoral diseases.

Although it is not at this time necessary to insist upon the truth of the physical signs to those who are conversant with them, their certainty may still appear questionable to a few who are not practically acquainted with them. As these signs are based upon the settled laws of physical science, and in fact involve some universally admitted principles, the only reason for doubting their accuracy is a want of due knowledge on the subject. But as a certain acquaintance with them is necessary to appreciate the evidence upon which they depend, I may properly enough point out what is included under the terms physical exploration and phy-

sical signs. Physical exploration includes the modes of ascertaining the changes which occur in the physical structure of organs; these changes we appreciate by the alterations of form, and by the sounds produced in the interior of the body by the motion of solids, or of elastic or non-elastic fluids, or by the resonance which is yielded by the surface when tapped or struck by the finger. This latter mode of examination obviously depends upon the different density of organs, and in the cavity of the thorax, chiefly upon the existence of air, and the percussion is more or less clear or dull, as the quantity of air contained within the thorax is greater or less. The alterations of form are few in number, and are readily learned; but the signs dependent upon changes in the sounds produced by the passage of the air and of the blood within the thorax, or the resonance of the air when thrown into motion by the act of speaking, seem comparatively difficult, and involve more complicated phenomena. The same remarks are applicable to the signs of percussion, which are not a little difficult; but in either case, the sounds are regularly and uniformly the same under similar circumstances. The difficulty in learning the physical signs consists in two distinct points; first, in the acquisition of the sounds themselves, considered as simple phenomena; secondly, in the knowledge of the condition of the organs which corresponds to these sounds. The sounds themselves require not only to be learned well enough to be understood, but they must be fixed so thoroughly in the mind that no room should be left for mistaking one for another. This demands time, attention, and organs of hearing which are not physically incapable of discriminating between sounds which at first may seem nearly similar. The first difficulty is surmounted; there still remains the other, which requires a knowledge of many circumstances which are connected with the pathology of the disease. These are those which relate to the physical condition of the organs or the pathological anatomy of the parts, and to the functional action of the organs which is necessary for the production of most of the sounds. Hence the knowledge of the physical means of exploration requires no little time and attention, and cannot be learned in a careless or hasty manner.

There is, therefore, this impediment to the study of the diseases of the chest, and of physical exploration, that the act itself is a matter of difficulty, and requires more labour than is willingly bestowed upon it. The whole process of investigation requires this attention; even the manual or mechanical precautions necessary to be taken are not to be learned at the first trial, but require time in the performance of this art, like that of every other; for the ear and hand are not at first capable of the delicate and varied actions necessary for the satisfactory exploration of the thorax. But, although the apparently complex nature of physical exploration may prevent many from attempting its study, the difficulties which at first present themselves are readily enough removed by patient and laborious attention, and are more than compensated by the certainty which results from a mode of investigation based upon fixed physical laws. Every step in the acquisition of this knowledge is appreciable, and in proportion as it becomes more accurate, the diagnosis of disease assumes a new character, which is never acquired when confined to the functional symptoms. This is true even at present, when the comparison of local and general symptoms to which I have just alluded has rendered the latter much more clear, and their value better defined. The physical signs have served as a point of departure, with which to compare the rational symptoms, and have thus rendered the latter more easy of recognition, and more positive in their relations with the internal lesions of the thorax. This is so obviously the case, that a glance at the works of any of the later writers upon the subject is sufficient to show that the rational signs have become of more practical service for the study of diagnosis than they have ever been before, and that many of these symptoms have been investigated with a care which was never before bestowed upon them. Some symptoms, it is true, have fallen into comparative neglect, because they are no longer of decided utility in diagnosis, but the greater number have derived new value from their connexion with the physical signs.

As the diagnostic characters of the diseases of the chest are composed of several distinct sets of symptoms, they may be studied after each class of symptoms has been separately learned, or the diseases themselves may be first observed, and the symptoms analyzed as

they present themselves at the bedside. The former method is naturally adopted in a systematic treatise, or course of lectures; the latter belongs more properly to clinical or demonstrative medicine,—a subject of which I treat more at large in another place. As the object of the present series of lectures is not only to explain the mode of application of these methods of investigation to the study of disease, but to teach the methods themselves, it resolves itself naturally into two parts. The first part will contain the explanation of the physical signs, and teach the method of acquiring them which I have found most convenient for the pupil. In connection with this portion of the lectures, I shall treat of those functional symptoms which are immediately connected with the organs of the thorax, and are therefore most conveniently studied at an early part of the course. The second part will be devoted to the study of individual diseases in connection with their symptoms and treatment. The series will thus comprise, as nearly as my time will permit, a complete history of the modes of exploration used in the diseases of the thorax, and of those diseases themselves.

The difficulties which attend the study of pectoral diseases, depend more, however, upon an imperfect method, than upon the subject itself, and may be obviated in a great degree by adopting an order which is in harmony with the natural connexion of these signs. In all essential particulars they are readily understood when they are pointed out by one who is practically familiar with them; one who is yet unpractised becomes embarrassed when he examines a patient without the aid of an adviser. Signs which are really different are sometimes confounded together, and those which are mere varieties of the same species are thought to be perfectly distinct. If the signs are well characterized sounds, their discrimination should always be easy, and error would be impossible. That is, the correspondence between the sounds in certain physical conditions is necessarily exact, and the chances of error depend upon an erroneous interpretation of them. The interpretation is very different from the recognition of the sounds, and necessarily includes more data and more complicated reasoning; but there can be no reason for not detecting a sound connected with the chest; it should be at least as easily recognised as the tone of voice or spoken language; it does not require any peculiar nicety of organs, or a finely cultivated musical ear, but merely a good organ, and the attention necessary for observation of any natural phenomena. I shall endeavour to arrange the physical signs in such an order as will facilitate this part of your study, and shall explain the method of acquiring them which you will find most convenient. The great secret is to give great attention to the signs at first, and fix each one in your mind as you go on. If you content yourselves with detecting them when pointed out to you, and merely understanding the differential characters without actually knowing them, you will gain but little, and you will never acquire the knowledge of them which is practically useful. The best method of avoiding the habit of careless observation, is to dwell long upon each sign at first, and afterwards connect it with others which are closely related to it, and are met with either in the same or in other patients. The whole matter will in this way be rendered singularly easy.

CASE OF ACUTE PERITONEAL ENTERITIS.

BY WILLIAM ZOLLICKOFFER, M. D.

To the Editors of the Medical Examiner.

Gentlemen,—On the 2d of February, I was called to visit the wife of Mr. S———, of this place, who, I concluded, after minute examination, to be labouring under acute peritoneo-muscular inflammation of the bowels, the symptoms being such as to characterize, with considerable accuracy, this state of enteritic diseased action; with the exception of the condition of the pulse, in conjunction with the whole of the cutaneous surface, the latter not having undergone any modification in its aspect or temperature, nor the former being increased in either quickness or frequency beyond the natural standard, although the wide spread organic derangement throughout the whole intestinal canal, as exhibited from the *post mortem* examination twenty-four hours after her dissolution, was such as rendered it somewhat surprising that the surface and sanguiferous system, should have remained silent in expressing, to some extent, the morbid lesion of the parts involved in the case of Mrs. S. From what will be seen in the sequel of this paper, the present case will readily be acknowledged as a striking evidence illustrative of the difficulty under which the professional man sometimes labours, in forming a correct idea in relation to the extent of diseased action

with which he has to combat, from the circumstance of some intervening unknown cause, preventing the general system from expressing all those symptoms by which it may clearly be ascertained.

In the present case, the bowels were obstinately constipated; so much so, that I was unable to procure a single dejection of any kind. The pain in the umbilical region was lancinating and incessant; the abdomen considerably tumefied and sensitive, and the pain increased upon the slightest pressure; tongue covered with a white fur, the edges of which were of a pale red; thirst very considerable. The third day singultus occurred. Fourth day stercoraceous vomiting commenced, and continued until the sixth day, when death closed the scene of Mrs. S.'s suffering.

The therapeutic course adopted in the treatment of this case was such as the urgency of the symptoms loudly called for,—venesection carried to a sufficient extent to produce an impression on the sanguiferous system. Cathartics and accoproctics of different kinds were varied to suit circumstances. Injections were frequently exhibited, from the emollient to the more stimulating, and epistastics applied over the whole extent of the abdomen, &c.

Post Mortem appearances twenty-four hours after Death.

The whole of the peritoneal and muscular coats of the bowels exhibited, from the pyloric orifice to the lower end of the rectum, a perfect mass of inflammation. The cœcum was mortified. There was a stricture in the ileum of three inches in length. Adhesion of a portion of the cœcum to the left side; also of the rectum throughout its course, to the left side of the sacrum. The peritoneal coat of the whole abdominal parietes exhibited the same state of inflammation as that of the intestinal canal; the bowels were enormously distended with flatus; mucous coat not impaired; stomach distended with the contents proper to the bowels; gall bladder filled with a viscid, dark fluid; liver rather lighter coloured than usual; the abdominal cavity contained a considerable quantity of a sero-purulent fluid. From the above representation of facts in relation to the case of Mrs. S———, it may justly be concluded that her disease terminated in effusion and gangrene.

In the above examination I was assisted by my esteemed and intelligent friend, James L. Billingsba, M. D. This communication has been drawn up in the most concentrated possible form, in order to cause it to occupy as little space as practicable, without, at the same time, omitting any thing of material importance. If it is deemed worth an insertion in the "Medical Examiner," you are at perfect liberty to give it publicity.

Middleburg, (Md.) 7th May, 1840.

EFFECTS OF FERRI FERROCYANAS IN CHOREA.

BY WILLIAM ZOLLICKOFFER, M. D.

To the Editors of the Medical Examiner.

GENTLEMEN,—In December, 1839, the daughter of Mr. Haugh, twelve years old, claimed my professional attention. She had been labouring under chorea about four weeks before Mr. H. called on me to visit her. At the time I commenced treating her malady, it had assumed rather an aggravated form. Supposing that the disease was attributable to gastro-intestinal irritation from worms, I directed successively the various anthelmintics in use; which were succeeded by the exhibition of castor oil, senna, and salts, without procuring the dislodgement of even a single worm, or mitigating the violence of the paroxysm. To carry out this plan of treatment required ten days, during which period I procured frequent and copious dejections. I now concluded that the disease did not arise from irritation of the stomach and bowels, occasioned from worms, the accumulation of fecal matter, or any irritating substance located in the intestinal canal. That it did not exist as a consequence of suppressed catamenia was very obvious, as the child had not arrived at the period at which the menses usually makes its appearance.

Influenced by these views, I deemed it advisable to direct the use of such remedial agents as were calculated to produce an impression on the general system. I commenced this course with camphor, in association with opium, without any benefit. I then substituted quinine, in combination with assafœtida, and the result was the same. The cuprum ammoniacum was then given a fair trial; and the nitras argenti, and subcarbonas ferri præparatus, successively, without the least visible alteration in arresting the violence of the disease. Last of all, I concluded, pretty much as a dernier resort, to give the ferri ferrocyanas a fair trial, and commenced with doses of three grains, made into pills, three times a day; and, in six days, the malady was entirely removed, and the child has been perfectly free from the slightest symptom or evidence of the disease ever since. This is the second case in which I have experienced the good effects in chorea from the use of the prussiate of iron.

Middleburg, (Md.,) 7th May, 1840.

FOREIGN CORRESPONDENCE.

LETTER FROM PROFESSOR MARTINS.

No. VI.

Course of General Pathology by Professor Andral—Lecture on Cancer.

PARIS, 25th March, 1840.

To the Editors of the Medical Examiner.

TUBERCLE is a product, without analogy in the healthful condition, which is developed under the influence both of general and local

causes,—and the same may be said of cancer. For a long time it was very ill defined, and its name is merely an allusion to the *devouring* character of its progress. Tubercle is merely a product to which the name of tissue cannot be applied. Cancer, on the contrary, is composed of two abnormal tissues, united or isolated, to which the name of cancer is indifferently applied. These two tissues are, first, the *scirrhous;* secondly, the *encephaloid* or *cerebriform* tissues. After tubercle, cancer is the disease which carries off most victims; it is developed in every tissue and every organ. However, the lungs, the favourite seat of tubercle, are very rarely primitively affected with cancer, while it is often found in the liver, where tubercle so rarely shows itself.

The characters of the scirrhous tissue are the following: it is hard, grating under the scalpel, of a bluish white, semi-transparent, or transparent; its mass is not homogeneous, but divided into lobules separated by fibrinous intersections, and of a duller colour. Finally, it is without vessels. As the disease advances, (which is unfortunately the usual occurrence,) it loses its consistency, softens, becomes gelatiniform, or glue-like, and destroys itself by loss of substance, and ulceration. In the midst of these ravages, its fibrinous walls remain intact. Under the name of scirrhus has not always been comprised the tissue of which we speak. In the celebrated memoirs of the Academy of Surgery, organs indurated after chronic inflammation are designated under the name of scirrhus; we often see spoken of scirrhous lungs, which can be explained only by giving to the word scirrhus a different signification from that which we attach to it.

The encephaloid, or cerebriform tissue, has been so named by Laennec; but this appellation is correct only in certain stages of its development, when its consistence resembles that of the brain. Surgeons sometimes call it *medullary fungus.* Its characters, and mode of development, are the following: it is at first hard, without, however, creaking under the scalpel, of a milk-white colour, opaque, containing a great number of vessels. The latter are here developed as in false membranes, and in the normal membrane which surrounds the yolk of the egg. This development may be followed step by step. When a tissue of the kind is injected, it is soon perceived that it contains many more arteries than veins. This is owing, as has been shown by Professor Berard, to the fact that many veins are filled with encephaloid matter, which prevents the entrance of the injected liquid. This encephaloid matter is found not only in the veins of the tissue itself, but also in the surrounding veins which are connected with it. These anatomical peculiarities cannot be verified throughout; however, M. Andral has seen the veins of the liver strongly distended with the encephaloid tissue. After the encephaloid tissue has existed for a length of time, there is detected in it a liquid matter, of a milk-white colour, often not very apparent, and only to be squeezed out by pressure. This is what should be called encephaloid matter; it is this which may be absorbed, and give rise to secondary cancer. When this liquid is not very abundant, cancer is still in the state of crudity; but at the end of months, or perhaps years, it softens, owing to the more abundant secretion of the liquid matter, becomes congested, inflames like a healthy tissue, its numerous vessels are ruptured; hæmorrhage, more or less frequent, supervenes, which may be slight, or very abundant, and sometimes mortal. In cancer of the breast, in some cases, these hæmorrhages are seen to supervene before the appearance of any ulceration; the blood oozes out by little holes, almost imperceptible; then the encephaloid mass is reddish, fungous, and many authors term it *fungus hæmatodes*—a name also applied to erectile tumours. At this stage, ulceration takes place; this ulceration is never cured, but extends its ravages, the tissues which it reaches being converted into the encephaloid tissue. A few instances, however, unfortunately very rare, have been seen, in which a modification of the laws of nutrition brings about cicatrization. At other times the encephaloid mass passes into the state of gangrene, and detaches itself: this termination is not more common than the other. Instead of forming a separate mass, the cancerous matter may infiltrate the tissues; and this species of cancer is termed *cancer by infiltration.*

In the midst of the two tissues which constitute cancer, namely scirrhus and the encephaloid tissue, other substances may appear; but they are merely accidental, and no constituent parts of cancer itself. Such are mela-

nosis (melanotic cancer) of the cartilages, and of the osseous and cartilaginous masses.

The solids, in the midst of which cancerous matter is deposited, may be affected by it in various manners. They may be pushed aside, destroyed, or transformed into cancerous substance. Cancer may be developed everywhere in the sub-cutaneous, sub-mucous, intermuscular, parenchymatous cellular tissue. It is rarely primitive in the coats of the blood-vessels; it often even spares the large arteries and veins, merely compressing them. It is thus that we see the aorta surrounded by a cancerous mass, without itself becoming so. The large veins are oftener affected than the arteries. Cerebriform matter, as we have seen, is found in the interior of the veins. Some, influenced by theoretic views, see, in this, blood transformed into cancerous matter; others, cancerous matter absorbed. This latter opinion, without being definitively proved, is the more probable. The lymphatic system is often affected. However, primitive cancer of the lymphatic glands is rare; but it often shows itself in them consecutively. The following is a remarkable instance of the ravages of cancer upon the lymphatic system. A lady had a very small cancer of the tongue. It was removed: there was no relapse. But, after the lapse of some time, the glands of the neck became cancerous, and formed an enormous mass, which carried off the patient. Cancer of the nervous tissue presents itself usually under the encephaloid form in the nerves, and especially in the brain. In the muscular tissue, it is consecutive, never primitive; in fact, this tissue undergoes no transformation, but its fibres become pale and atrophied without changing in character. Cancer of the tongue is developed in the sub-mucous cellular tissue. This is the tissue of all others in the economy most liable to its attacks. It may also be developed in the mucous tissue itself, under the form of vascular, encephaloid tubercles, or vegetations, resembling in vascularity the tissue in which they originate. A form of cancer shows itself in the skin, which is peculiar to it: it consists of little flat excrescences, which remain long indolent, and end by softening and ulcerating, often with very rapid progress, (Lupus Esthioméne.) The serous tissue is rarely primitively affected: the cancerous masses of the omenta originate in the sub-serous cellular tissue. In the bones, cancer may have three different points of origin: first, in the body itself of the bone; secondly, in the medullary membrane; thirdly, between the external periosteum and the bone. Cancer of the thyroid gland is rare, and I know of no authentic example of its having originated in the pulmonary tissue; this latter it attacks only consecutively, and shows itself under the form of round, encephaloid masses, scattered through the parenchyma of the organ. It is often primitive in the liver; when it appears here consecutively, it is consequent on scirrhus of the stomach. The spleen, kidneys, ovaries, neck of the uterus, penis, may all be affected with cancer. The disease in the ovaries is rare, in the uterus very common, but nowhere so much so as in the mammæ.

Cancer often developes itself at several points simultaneously, and travels, so to say, through the economy: this is specially true with regard to the encephaloid tissue. In this point of view, we distinguish three several varieties of progress: first, several parts may be simultaneously attacked, without the possibility of pointing out any well-marked point of departure; secondly, an isolated part may be attacked, and the neighbouring ganglia become consecutively infected; thirdly, after a part is attacked, the neighbouring ganglia become involved, and then all the organs. Very often immediately after the surgeon has removed a cancer, the disease is seen to develope itself at the same time throughout the system, then to reproduce itself in the very point where the operation was performed.

There certainly exists a general cause which occasions the production of cancer, but it is difficult to define it. To a certain point, we are able to diagnosticate in certain persons a diathesis favourable to the development of tubercle; but this is not the case with cancer. It appears alike in all constitutions. In opposition to tubercle, it frequently developes itself after the age of thirty-five, and is quite rare after sixty-five. There are two exceptions to this rule; namely, cancer of the eye, and the cancer of chimney-sweeps.*

Inflammation cannot contribute to the de-

* I may add a third, the variety of cancer of the face, known under the term *lupus*, which is often noticed before the age indicated by M. Andral.

velopment of cancer, but it may determine its appearance in one point rather than another. Many women receive blows on the breast, are affected with mammary inflammation and abscesses, without their becoming cancerous. In others, this horrible disease declares itself without any known developing cause. Its progress is usually chronic; it has been seen to spread with a rapidity equal to that of acute diseases, and in these cases its termination is almost always fatal.

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At the request of a number of subscribers of the Examiner, we commence the publication of a series of lectures on physical exploration, and on the diagnosis and treatment of the diseases of the chest. Experience abroad has shown most clearly that the requisite supply of original matter for a weekly cannot be obtained without either introducing a very large proportion of isolated cases, which the majority of readers scarcely look at, or of resorting to courses of lectures which are from time to time delivered both in various medical institutions, both public and private. If the latter are uninteresting to those readers who may have devoted much attention to the subject, they are useful to a great proportion who may have never made the department which forms the subject of the lectures an object of especial study, or who may derive more complete information upon the subject than they can readily obtain from the ordinary sources.

The lectures on the diseases of the chest will contain a complete course, as full as may be convenient: they will be afterwards published in a separate form for the convenience of those who may desire the work separate from the Examiner.

FOREIGN SUMMARY.

PHILLIPS' LECTURE ON THE PRINCIPLES AND PRACTICE OF SURGERY.—NO. V.

WOUNDS—(Continued.)

INCISED *Wounds: Treatment.*

CONTUSED *and* LACERATED *Wounds: Peculiarities—Treatment.*

GUN-SHOT *Wounds: Their Characters—Varieties—Symptoms.*

Treatment.—In the treatment of incised wounds, the principles are simple and obvious; if the wound be not complicated by the presence of a foreign body, bring the edges together, and keep them so; and if any accidents arise, treat them. To accomplish these indications, certain things are necessary, a good position, adhesive straps, bandages, sutures. First, with regard to *position*, you would not place a man on his back who had a wound of the occiput, and, *vice versâ*, if a wound implicated the extensor muscles of the limb, you will place the limb in extension; the ends of the divided muscles will then be brought nearest together. If it implicate the flexor muscles, flexion will manifestly be the position. Supposing you have to treat a wound implicating, transversely, the anterior parietes of the abdomen, you would not place a pillow in the small of the back, but you would raise the pelvis and the chest. If the wound were longitudinal, implicating the fibres of the rectus, an opposite course would be necessary. Again, position is of great importance with reference to the circulation, to the reflux of venous blood. If the leg be wounded, and allowed to hang down, the course of the arterial blood towards the point will be facilitated; that of venous blood from the part will be interrupted by the influence of gravitation. So decided is this influence, that Piorry stated, what I have partially confirmed in one case, that hæmorrhage from the radial or ulnar artery may be arrested by keeping the arm up above the head. We must, however, be careful, that in attempting to get rid of one inconvenience we do not incur another; that, in attempting to facilitate the return of venous blood, we do not prevent the escape of pus.

With regard to *strapping*, that of isinglass I prefer, as being less irritating. Straps act by their adhesion to the integuments; therefore their force is, to a considerable extent, dependent upon the adhesiveness; to a great extent upon their length: thus a strap two inches long will act with much more force than a strap of one inch. Straps act only on the integuments; therefore, when we wish to act on deeper parts, we must employ some other agent. There are, it is true, certain muscles which may be acted upon by the skin, the platysma, the occipito-fontalis, the orbicularis oris—still the moisture about the lips will loosen the straps, and sutures may also be necessary.

By means of *bandages*, we can, in certain cases, exert more power in bringing parts together than by adhesive straps. They act more decidedly on the deeper seated parts; they are especially convenient in longitudinal wounds. The bandages commonly employed for this purpose are either tail bandages or rollers. It is often necessary to associate compresses with the bandage. Supposing we are dressing a longitudinal wound, affecting the anterior part of the thigh, you would place one compress to increase the support at the inner, and one at the outer side of the wound. But even when

well applied, it is seldom that the bandage is perfectly efficacious, that it exactly maintains contact between the edges of the wound; much of its action is lost in compressing the part perpendicularly to the surface. Still it prevents the wound from gaping as much as it might otherwise do. Compresses well applied have this advantage, that they only make pressure at two points of the circumference, and therefore interfere less with the circulation than circular bandages.

Of all the means employed to maintain wounded surfaces in contact, *sutures* are undoubtedly the most efficient. The older surgeons employed them perhaps too frequently. The moderns came to the conclusion in the last century, that so many inconveniences attached to the use of the suture, that it should be very rarely used, and by some it was actually proscribed. Within a few years, a new doctrine has been promulgated, and it is recommended in a large number of cases. Still, differences of opinion exist with regard to it at present. The introduction of two or three needles cannot be done without pain; it is also said that they irritate the muscles, and produce a tendency to spasmodic contraction. A still graver reproach has been made to them, that they break through the tissues, and are thus more hurtful than useful. It is very true that this occasionally happens, but from imprudence, by endeavouring to overcome a resistance which was not likely to yield. Those of you who attend hospital practice have seen their great efficacy in hare-lip, wounds of the face and abdomen, and elsewhere when too powerful muscles are not implicated; but if you attempt with threads to bring together large wounds of the deltoid or the muscles of the thigh, you may expect to experience the inconveniences we have spoken of. They will be found useful where a flap exists with its base downwards, and where the flap must be sustained. Such as a sword cut in the deltoid. Here there is no resistance to overcome; all that is required is support. It will be found very useful in wounds occurring in elderly people, who have been very stout, but are no longer so. In them the skin is very flaccid, the surfaces can be easily brought together, but the flap tends to curl up, and union is prevented. Sometimes there are indications for using the suture more pressing than the fear of deformity; the masseter and buccinator muscles are cut through; the parotid duct is implicated; if union does not take place, fistula will succeed. In wounds of the eyelid, it must often be employed. There are parts which are occasionally divided, and where position, strapping, bandaging, will not succeed—the tongue, for instance; here the suture can alone be used. Again, it is no less necessary in wounds of the abdominal cavity, out of which the viscera may glide, if the wound be large enough to allow of their escape. Still, the use of the suture in large abdominal wounds is sometimes followed by convulsions, vomiting, intense pain, which resist every kind of treatment; therefore they should not be used unless the necessity be absolute. Some men use the suture very generally, because contact is more exactly and more certainly maintained, and the necessity for firm bandaging, from which, in many cases, congestion at the wounded surface results, is done away with.

Sutures are not all of one kind: those at present commonly employed are the interrupted suture, the twisted, and the quill suture. The first is made by passing a needle armed with a thread, from without inwards of one lip of the wound, and pressing it from within outwards of the opposite side, and tying a knot on the surface. Where there is not much resistance, this does very well, as in sustaining a flap for instance, in amputations of the breast, the testicle, &c. If the object of the suture be to maintain very exact contact, this suture will not do. In any autoplastic operation, you do not see it employed, but the twisted suture. In the twisted suture the needles remain; we insert them as much deeper, as it is possible the resistance will be greater. Having inserted the needles, having taken care that they have penetrated at exactly opposite points, the lips are brought together by twisting the suture either circularly or in the form of a figure of 8. In this way more exact coaptation is maintained. These needles are left in place for three or four days; at that time union is usually sufficiently advanced to admit of the removal of one or all, according as union may be more advanced at one point than another. If the needles destroy the tissue, it is usually from the inattention of the surgeon: if there be likelihood of its giving way, much may be done by supporting them with straps or bandages. The quill suture is made by passing threads through both lips of the wound as in the interrupted suture, but instead of knotting them upon the surface, we fix them on each side upon a cylinder of bougie or quill, or other convenient substance. The advantages of this kind of suture are, that the drag, instead of being upon several points, which may give way, is spread over a considerable surface, and we may thus employ with impunity a greater force for bringing the parts together; more action is also exercised upon the deeper parts of a wound. The quill suture is therefore the best means of procuring union in a wound, where there is considerable fear of the parts being dragged asunder—certain wounds of the abdomen, lacerations of the perineum. The use of different sutures may thus be summed up. The interrupted suture does very well where the wound is superficial, where much force is not required, and where very exact adaptation is not important: the twisted suture, when exact adaptation is necessary; the quill suture where there is much resistance, where

the wound is deep, and where all parts of it should equally be brought together.

In the treatment of wounds, however, very often more is necessary than position, strapping, bandages, and sutures. We seek to obtain union by "first intention;" if the inflammatory action be insufficient, or if it be more than sufficient, this effect may not be obtained; and therefore it is most important to excite it when insufficient, to moderate it when excessive. If the inflammatory action were first sufficient, it would be obviously improper to employ, on the one hand, irritating applications, and on the other relaxing ones. In most cases cold water is a good application; but if energetic local depression of vital action be required, irrigation will be found more effective. This irrigation may be accomplished conveniently by suspending a bottle of cold water in a proper position; placing in it a few threads of lamp cotton, one extremity of which should reach to the bottom of the bottle, the other hang out at its mouth: in this way you get a species of syphon, and a constant dropping upon the lint or linen covering the part. The part should, of course, be kept at rest. The mind should also be kept quiet; mental disquietude often exercises a very decided influence upon the healing of wounds. It is, probably, because the mind is quiet, that, in the operation of lithotomy, nine children out of ten do well; it is probably why, in brute animals, wounds generally do well. Certain persons are more irritable or excitable than others, and in those wounds often do ill. Thus, in wounds of the head, it is important that the eyes should not receive the impression of light. In bad wounds, noise is often prejudicial; thunder, or a discharge of fire-arms, has been known to excite tetanus. Moral and physical quiet are, in many wounds, most important.

With respect to food, I think the common practice incorrect. I rarely diet rigidly after operations; I think it is often injurious. I feed carefully until traumatic fever is developed; I then lessen the quantity of food until that subsides, then recommence the proper diet. The ordinary treatment is different: the diet is very rigid until free suppuration takes place. I support the opposite opinion, because I have seen the bad effects of abstinence after great operations or wounds. My plan is, to let the patient's diet be much what it was before the injury, even though it might be objectionable; and this I do upon the Hippocratic principle, that bad things, when habitually taken, often do better than good things to which the patient is unaccustomed. When a patient is suddenly subjected to rigid diet, the biliary secretion continues to be poured into the intestine, and in many cases irritates it. I would not wish you to stuff your patients, but I wish you to feed them moderately. There are patients affected with worms; if you place them upon a rigid diet, great intestinal discomfort will be experienced: give the patients food, and these discomforts will be dissipated. In hospitals it is especially necessary to direct attention to these things, because your orders are more clearly carried out than in private families; and I believe it is because such orders are not strictly carried out that wounds often do better at home than in hospitals. Do not, therefore, ride the abstinence hobby too hard; let your patients have a moderate quantity of digestible food.

It is very important to attend to the state of the bowels: when a patient is constipated, the abdominal circulation is troubled, the general circulation is accelerated, and there is often headach. It is never well, in large wounds, that there should be much effort to go to stool. A surgeon of great eminence, not many years ago, operated for stone: after the operation, he did not inquire as to the state of the bowels; for ten days all went on well. The patient strained in endeavouring to go to stool, burst a blood-vessel, and died of hæmorrhage. Quiet and regimen—are they always sufficient in all wounds? Must we sometimes bleed? If the patient be strong, but has lost much blood, the face be pale, and the loss seem sufficient to prevent febrile reaction, it is clear that we should not further deplete. It is the same in a debilitated constitution, even when little blood is lost. In both cases bleeding would be injurious. If, however, the patient be in rude health; has lost little blood; has a large, deep wound; a hard, quick pulse; a heavy head; a suffused countenance; the indication is manifest: to spare blood-letting would be a fault; the quantity of blood circulating in his veins should be diminished.

An incised wound may not heal by first intention; it may suppurate: when we remove the dressings by which we had hoped immediate union might have been obtained, the wound is gaping, and a puriform fluid may be seen; sutures, if any, may be at once removed, or they will give way; if, however, it be a great object to keep the edges, as nearly as may be, approximated, they may be left unless they excite irritation. In these cases the edges will never be brought to touch each other, but granulations are developed; a tegumentary membrane ultimately covers them; it thickens, becomes redder, but ultimately acquires a whiter colour than the adjoining tissues. This membrane is at first slowly formed along the edges, more rapidly as it approaches the centre, and appears to drag the edges of the wound towards the centre, so as to lessen the surface. This tissue never acquires the character of the cutaneous integument, has no papillæ, and is a cellulo-fibrous and vascular tissue.

Tactile sensibility is less remarkable than in the skin. Sometimes, either from negligent dressing or other cause, cicatrization is badly done; the surface is puckered; these

cicatrices are not only disagreeable to look at, but often they interfere with the motion of parts: these are seen most frequently in burns.

In all cases, the present system, in my opinion, is, to interfere too much, to dress too often; when a wound is dressed, it should be left for many days; until, in fact, the dressings are very wet with the fluid secreted by the wound, or very offensive, or pain or uneasiness be felt. I am quite sure that the less frequently, consistently with the circumstances I have mentioned, dressings are renewed, the sooner a wound heals.

Contused and lacerated Wounds.—A lacerated wound may be produced by the bite of a horse or a cow, or any similar animal, by the action of a wheel passing over a part, by the action of machinery, or by any similar agency.

If an articulation be implicated, the ligaments seem to give way first, the skin and muscles later: we can scarcely say the muscular fibres are ruptured; they are separated from the tendons, or the periosteum. In Mr. Langstaff's museum are the ends of two thumbs which have been torn off, with a long tendon attached to each, but no muscular fibres. Usually, however large be the blood vessels ruptured, hæmorrhage ceases spontaneously; that is owing to two circumstances: the vessels are almost always ruptured high in the substance of the mass, so that they are compressed on all sides, and the three arterial tunics being unequally extensible, are ruptured at different levels; the internal and middle give way first, and are therefore ruptured highest; the external, more extensible, bears considerable elongation before it gives way, and when it yields, forms a kind of cone, which is ruptured much lower than the others; it is retracted, twisted like a cork-screw, and effusion of blood is prevented. Usually these wounds are not very painful, and the consequences are often not serious. It rarely happens that the pain is very acute; the patient is usually calm, and tetanus is very rare; suppuration occurs early, and cicatrization soon follows. Many remarkable cases are on record, none more so perhaps than that of Cheselden; the patient was a miller, who had around his arm a rope which got entangled in the wheel of a mill, which was revolving rapidly; he was raised from the ground until his body was arrested by a beam which prevented further ascent; the wheel continued to revolve, and the arm and scapula were separated from the rest of the body. He was unaware of the extent of his injuries until he saw his arm moving around on the wheel; there was no bleeding, he was able to walk down a ladder, and walk some steps to look for assistance. He got well in two months. We shall now proceed to consider contused wounds, which are often very similar to those on which we have been speaking.

Contused Wounds.—Contused Wounds are produced by blunt bodies moved with more or less velocity; they participate of the nature of contusions and of ordinary wounds. The contusion is sometimes superficial, limited to the skin and subcutaneous cellular tissue; it may be more intense, and implicate the whole thickness of a limb. Sometimes it appears trifling upon the surface, while it is severe underneath; in these cases the superficial parts have yielded, while the deeper-seated parts have resisted. A rounded body strikes the abdomen obliquely; there is no trace of contusion on the skin; even the muscles are only slightly contused; yet there may be rupture of the aorta, the vena cava, the liver, or the intestines, and sudden death. When the contusion is slight it leaves few traces, and scarcely any pain; when severe, there is ecchymosis, pain, tumefaction. If you dissect a recently contused part, when you cut into the cellular tissue it is more or less gorged with blood; in some cases the blood is still liquid, many vessels are ruptured; if you carefully examine you find a certain quantity of laceration. Upon the surface the discolouration is soon seen, and it terminates in a yellowish areola; these clots of blood are not always absorbed, sometimes they break down, become painful, and require operation for their removal. The quantity which may be absorbed is sometimes enormous. When the contusion is accompanied by a wound it may be regular, and the edges may be very little ecchymosed; they may be jagged, infiltrated with blood; and if it be narrow there may be extravasation of blood in the thickness of the parts. All contused wounds are not painful; but if the contusion be severe there may be absolute insensibility of the part; it may produce a state very like the death of the part. Lamotte describes a case where a billiard boy was struck on the arm with a cue, so severely, that his arm seemed dead for ten days; it was only at the end of that time that heat and sensibility returned to the part.

In a contused wound it is sometimes difficult to determine whether the tumefaction depends upon inflammatory action or extravasation; generally the extravasation of blood is immediate, or nearly so; the inflammatory tumefaction is not usually much developed for twenty to forty hours.

In some cases the edges of a contused wound will heal without suppuration, but it is not usually the case. In some instances the inflammation is so violent as to destroy the patient before gangrene is developed; in others, the suppuration is excessive, and the patient dies exhausted.

Treatment.—The important question to be considered is, how are these wounds to be treated; should we attempt union by "first intention?" No general direction can be given on this subject; nothing is more variable than such wounds; a part of such a wound may heal by "first intention;" another part will suppurate; this usually depends upon the de-

gree of contusion. As these wounds, when left to themselves, almost always suppurate, it is desirable in many cases to seek to prevent, in others to confine it within narrow limits. If simple, it should be carefully cleaned with a fine sponge and warm water, to remove coagula, or any other foreign substance which may adhere to it; then bring it together with strapping or suture. If you can bring together parts whose contact will not irritate, you will do better than by interposing lint or any similar substance. Depend upon it, a flap is, for the part from which it has been detached, the best topical application that can be made. Supposing the parts to be so contused that union is almost impossible, still you may bring the parts together, and gently support them with a bandage; but it should be carefully watched.

In France, Pelletan used to stuff these wounds with "charpie;" Dupuytren brought them together partially; Boyer completely. In these cases simple cold water irrigations are often very beneficial. Undoubtedly one of the best means of preventing inflammatory accidents in severe cases is general bleeding; leeches in the vicinity of such wounds I do not like; they frequently seem to increase inflammatory action, and often occasion erysipelas. In these wounds, spite of bleeding, rest, careful dieting, and attention to the bowels, gangrene will sometimes occur: in such cases warm emollient poultices will be useful; tonics to the wound and internally are, in cases of gangrene in contused wounds, usually improper. If it be limited to the integument, the sloughs will come away in due course. These sloughs are not always dark. If the contusion be very severe you should not think of amputation until all hope is lost; first, because we should always endeavour to avoid mutilation; second, because these amputatious are often fatal.

Surgeons of great experience have been in the habit of applying aromatic and spirituous substances to contused wounds, but now they are abandoned. At present men's minds seem to be divided between emollients, narcotics, and sedatives, but cold water is in most cases preferable to either; the necessary means should have been taken for bringing together and dressing, before the cold pads are applied.

Gun-shot Wounds.—Although as civilians few of us can have had much opportunity of seeing gun-shot wounds, they are held to form a necessary part of a course of Lectures on Surgery. We must, therefore, conform to the ordinary arrangement, by giving a condensed account of these injuries. The only opportunity which I have had of observing these wounds, was at Paris, in 1830, and although that experience would be insufficient to justify me in founding a consideration of these injuries upon those events, yet it affords me a means of testing the views of others, and selecting those which experience convinces me to be the soundest views on the subject. This class of inquiries found little consideration in surgical works before the 15th century, but even in the 16th they were regarded as poisoned wounds, and also as burns. In accordance with these opinions the two indications presented were, to cure the burn and to destroy the venom. Sprengel states his belief that to Paré and to Maggi must be attributed the change in opinion as to the burn and the poison.

Under the term gun-shot wounds we include all wounds caused by projectiles propelled by gunpowder. A gun-shot wound may perforate the integuments at one or two points; that is, the ball may have remained in the body, or escaped. Where there are two openings they may be directly opposite one to another, or they may have no apparent correspondence with each other. The direction of the ball, when losing its velocity, may be changed by many objects—by a bone, a tendon, or even an aponeurosis. A cavalry officer at the battle of Dresden was struck by a musket ball on the outer ankle; there was only that single wound on the limb, but the ball was extracted from the middle of the thigh. Under certain circumstances a ball may be reflected at a very acute angle. Marjolin mentions a case where two officers, whilst engaged in the chase of the wild boar, quarrelled; a meeting was, in consequence, fixed for the next day. During the chace, by chance, they were both together—a boar passed, one of them fired, and his adversary fell dead. Suspicion at once fixed upon the survivor the wilful destruction of his adversary. An old military surgeon was present, and knowing the effect of hard substances upon the course of bullets, carefully examined the place, and found upon an old oak, about the height of a boar, a very hard knot which bore the mark of the bullet. A spent ball may strike the anterior surface of the thigh, and may escape posteriorly, without passing through the muscles. In the attack upon Newport, a man was shot in front of the chest; the ball was found behind, but it did not penetrate that cavity. It may be received in the forehead, and extracted from the occiput, but without penetrating the skull.

Usually, a gun-shot wound has the form of the body which produced it, whether round, square, or oblong; but when there are two openings, that by which it has entered is almost always smaller than that by which it has escaped; its borders are depressed, whilst that of escape are raised like a tumour. This happens because at the time of entering, the velocity is greatest; but this is open to numerous exceptions—the ball may not have penetrated perpendicularly to the surface, may not have lost its velocity. If a ball strike against a bone it may be changed in form, may be flattened, may be shattered, or cut into two or more pieces. In the case of Serjeant Daly, at Newport, one slug appeared to have penetrated, but

it was shattered into many pieces upon the os frontis. When balls are ill cast they often contain air, or, when the lead has not been poured into the mould continuously, this may happen—a ball may break into several pieces. One portion of a ball may, therefore, pass out; another portion may remain in the part: consequently, the existence of the openings should not prevent your examining whether any portion still remain in the wound. Some authors deny this division of balls, and maintain that, in such cases, the piece must have been loaded with two balls. The shortest answer which can be given is to say, that two balls shot out of a gun never penetrate at the same point. Wherever you find that there is but one opening through which a ball passed into the body, and you find only one half the bullet, the chances are that the other half still remains, unless indeed half bullets were used.

In many cases bullets do not penetrate alone, but carry portions of dress or wadding with them; therefore it is necessary to examine carefully the clothes of the wounded person. When a ball has lost much of its velocity, it rarely makes a fair hole in the clothes, but carries a portion before it into the wound. These wounds are usually superficial, and in undressing, the ball may be extracted, with the article of dress which it has carried before it. We may, then, have a wound in which no bullet is found; it is therefore very necessary to carefully examine the clothes.

When a ball falls, at the end of its course, it is not at rest, but revolves with extreme rapidity; and if a person attempt to take hold of it, he may suffer severely.

The contusion produced by such bodies may extend to attrition: the course of the wound is livid, and this colour is owing to the disorganization of the part, and to the blood extravasated into the cellular tissue; formerly, it was supposed to depend upon the burn occasioned by the ball. In the present day we know that the temperature of a body projected by gunpowder is not raised during its course; it is not heated except it come in contact with a very hard body, against which it is flattened. These wounds are rarely very painful at the time; the sensation usually felt is a numbness—but that stupor may be so great, and extend so far, as to destroy life. They usually bleed little, especially when the divided vessels are small; hæmorrhage would seem to be prevented by the bruising of the parts and the retraction of the extremities of the vessels. When large vessels are partially divided there is sometimes hæmorrhage; when the section is complete frequently there is no hæmorrhage. If the eschar be not soon thrown off there may be no secondary hæmorrhage; and if you have an opportunity of examining the case, you will find both ends of the artery obliterated. In many wounds where a limb has been carried away near the trunk, by a cannon ball, there is no bleeding. Gun-shot wounds are rarely healed by first intention; there is attrition—there must consequently be sloughs and suppuration. No contused wounds are so dangerous as these, and this it was which induced the old surgeons to suspect poison.

A fatal wound may be inflicted, though the fire-arm contain no projectile; but then it must be fired off very near the person. A soldier wishing to destroy himself was suspected—his pistols were examined, they were loaded with ball; the balls were extracted by his comrades. He put one of the pistols in his mouth, fired it off; it burnt the tongue, blew out some of the teeth, fractured the jaw, and he died on the third day from cerebral concussion.

The wadding, if firm, may cause a mortal wound: usually it is intercepted by the dress, but now and then it penetrates to a short distance, and remains in the wound. It should be promptly extracted, or it may cause much irritation, and may remain in the part for years. In these wounds the stupor of the part and the concussion are less decided than in bullet wounds. A very brittle or soft body may equally penetrate; you may fire a candle, at thirty paces, deep into an inch board.

There is an important class of wounds about which it is necessary I should speak; those deep-seated and serious contusions sometimes produced while the integuments over the part appears uninjured; formerly supposed to be produced by the "wind of a ball." It is hardly necessary for me to lay before you the different theories upon which that opinion was based. Certainly the facts prove that the disorders observed do not result from a contusion produced by the displacement of a column of air. Many curious facts are recorded by military surgeons to demonstrate the impossibility of such injuries. The only reasonable explanation of such injuries is, that the ball has struck the integuments very obliquely; the skin yields, the deeper seated parts resist. Whatever the explanation, you must accept the fact—that the skin may be comparatively uninjured, while deeper seated parts are very seriously damaged.

Wounds caused by the bursting of fire-arms: we often see they are very variable; usually it is the left hand which suffers: the manner in which the piece is held also determines to some extent the situation of the wound—some persons grasp the barrel firmly with the hand; in most cases the injury falls between the thumb and fore-finger; it may lacerate this part, may blow off the thumb. Sometimes the superficial palmar arch is injured, and there is much hæmorrhage; at others the ends of the artery retract, and the bleeding is trifling. The surface is red, not black or livid, as when the part is struck by a bullet. If the articulations are uninjured, these wounds often do well without mutilation. Even when the thumb and indicator finger are blown off, it will often do well.

If a joint of the finger be opened, should we attempt to save it, or should we amputate at the joint, or in the continuity ?—According to the importance of the part should we anxiously seek to preserve the part. Some of these wounds will heal. If all the fingers are carried away, the thumb itself being wounded, we should endeavour to save it because of its usefulness, even though the stump be irregular. Occasionally the wrist is affected : if the wound be slight, whether penetrating the joint or not, every effort must be made to save the hand ; but if the injury to the carpal bones be great, amputation will be necessary. Dupuytren had an idea that amputation of the hand should hardly ever be performed in cases of wounds of the wrist; in this I think he is wrong—I have known lives lost in the endeavour to avoid such amputation. It is, however, very difficult to define the cases in which the operation is absolutely required.

Symptoms.—I have said that generally gunshot wounds are not painful ; the hæmorrhage is usually trifling : the diameter of the opening is no exact criterion of the diameter of the projectile : the edges are of a blackish red colour; this colour depends upon the attrition of the flesh, and the infiltration of blood. The symptoms which accompany them are primary or secondary. Among the primary symptoms are hæmorrhage and concussion ; the first is usually trifling, but it may be enough to destroy life. It is the belief of many military surgeons that of those who die on a field of battle, a large number die from hæmorrhage. The concussion is a consequence of the shock inflicted upon the part ; it may extend to a considerable distance—may be very severe when a hard part is struck, such as the cranium. It may produce a state of stupor of the part, from which the patient may not recover. It was so in the case of a soldier described by Quesnay; in him the hebetude was so great that when amputation was proposed to him, he answered that it was no affair of his. This stupor is the state in which a part of the body has almost entirely lost sensation and motion. In a limb so affected, the circulation is almost or altogether arrested ; the temperature is much depressed. If you cut into a part in this state, even at some distance from the seat of injury, blood does not flow. When this state extends beyond the injured limb, it is then general. Frights will sometimes produce similar accidents ; the face is pale, discomposed, covered with cold sweat, and the power of speech is lost. In 1814 a man was picked up in this state on the field of battle who had not a scratch about him; he was senseless for more than two hours. Sometimes instead of stupor we see spasm or general tremor ; sometimes rigors : the skin is corrugated, the pulse is hard and small, the countenance pale, and covered with cold sweat. When these symptoms are owing to fright or passion, warmth and stimuli will soon dissipate them. If the concussion extend to the liver there is often icterus. Tetanus may supervene immediately upon gun-shot wounds.

The hæmorrhage most to be feared is consecutive, for then we cannot get at the vessel ; and if we could, the tunics will be so softened by inflammation that a ligature will at once cut through them. These hæmorrhages may occur from the seventh to the fifteenth day after the accident. In these cases all that remains for us is ligature at a distance, or amputation ; and it is often difficult to decide between them ; when the limb is much injured amputation may be preferred, because gangrene in such cases is apt to supervene after the ligature. Amputation itself is uncertain in its results, in a patient enfeebled by pain, suppuration, and constant small hæmorrhages.—*Lond. Med. Gaz.*

Lactucarium. By Dr. Fisher, Knöig. Hofrathe und kreis-phisicus zu oels.—Aware that the list of medicines requires sifting and arrangement rather than addition, nevertheless the author of this paper desires, from ten years' experience, to obtain for Lactucarium a permanent place in the materia medica.

Lactucarium is known to be the juice obtained by making incisions in the stalk of the Lactuca sativa and virosa, and left to dry in the open air. It has an acrid taste and bitter smell, and contains malic acid, potassa, resin, and a glutinous matter, but no morphia. According to Buchner, the active principle is Lactucin, which is combined with the resin. The Luctuca virosa will yield three times as much Lactucarium as the Lactuca sativa.

The Lactucarium gallicum, (parisiense, *theridax* (θηρίαξ) *thcridace*), is obtained from the Lactuca sativa; the Lactucarium anglicum, from the virosa. The latter is very much the stronger, of which, according to Rothnel, half a grain will produce the same effects as two or three grains of the French preparation.

During the first century, A. D., the seed and the juice of the stalk of the Lactuca sativa were in high repute for their sedative powers. And many modern physicians (Francois, Coxe, Rothanel, Hueter,) who restored the use of the forgotten remedy, agree as to its efficacy.

The Lactucarium quiets without previously exciting, and produces sleep without insensibility; it allays morbid sensibility, lessens the action of the heart, and produces a general tranquillity throughout the whole constitution. In large doses it produces delirium without stimulating, diminution of nervous power, disturbance of the digestive functions, and vomiting.

The Lactucarium administered in small doses confines its effects to the periphery of the nervous system; in larger doses it affects the brain, and produces sleep by relaxing and exhausting the sensibility. It is, consequently, applicable wherever it is required to allay nervous irritation, and reduce an excessive

action of the vascular system originating in an abnormal state of the nervous functions, and where, on that account, antiphlogistics must be aided by sedatives and antispasmodics.

The field for its administration is in all the neuroses and neuralgia, especially the convulsions of childhood, when they do not originate in stomach affections, convulsions during difficult parturition (Hüter wendt Rothamel, Wiesner) spasmodic asthma, hooping cough, and cramp in the stomach. Material relief is afforded by Lactucarium to the distress and want of sleep attending hydrothorax and diseases of the lungs, as well as to the restlessness and anxiety of hysteria. Hyeter recommends it in spasmodic hæmorrhages, (spastichen blutungen) irregular hæmorrhoids, &c. It might, perhaps, be administered in the second stage of the arachnitis cerebralis and spinalis of children, when the bleedings, cold affusions, &c., which have been used for the tonic and clonic convulsions, have been of no avail, and we dare not give narcotics on account of the irritable state of the patients. It is probably useful in mania by diminishing the increased irritability of the brain, when we are afraid to continue the powerful antiphlogistics and derivative drain upon the alimentary canal, lest they should produce excessive debility and imbecility. Therefore Bramer rightly considers the Lactucarium as a medicine which, in delirium tremens, allays the excited state of the cerebral system, and thus induces the critical sleep, without the previous and simultaneous excitement of the vascular system, which is caused by opium and hyoscyamus.

To determine the question of whether the Lactucarium should be retained in the materia medica or not, we should inquire whether any and what peculiarities are discoverable in the juice of this plant, by a comparison of its effects with the effects of the narcotic substances which are now generally used as medicines.

From *opium* it differs in that it will bear no comparison with it as regards its narcotic effects; and likewise that it does not restore (as opium does) the normal relation to each other of the two agents of organic life by previously increasing the action of the vascular system, and therefore it is not contraindicated (as opium is) by a morbid excitement of the circulation.

From *belladonna* it differs in that the belladonna blunts, and at length destroys the sensibility of the nerves, whereas the sedative effects of the Lactucarium are the primary, and its action mild; it may, therefore, be administered in morbid sensibility which has nearly exhausted itself, and in inflammations, where the morbid irritability has passed into a state of constant pain: whereas belladonna can only be serviceable by destroying the sensibility.

The *conium maculatum*, like all narcotics, depresses the nervous system, but with this peculiarity, that it lessens arterial and muscular action by increasing the action of the veins. (?) The Lactucarium allays the sensibility immediately, without any effect upon the nervous system.

Hyoscyamus is a narcotic which produces mild but purely sedative effects: it brings on a state of paralysis as the consequence of a primary excitement of the nerves, so that the fatal narcotic effects of hyoscyamus are produced, not by apoplexia cerebralis sanguinea, but by paralysis of the nerves. It differs, therefore, from the Lactucarium by the sedative effects of the Lactucarium being obtained by a direct lowering of the sensibility, whereas these effects of hyoscyamus are preceded by an irritation of the nervous system.

Lactucarium is, therefore, recognised as a medicine possessing peculiar therapeutic properties, inasmuch as it quiets the nervous system, and, although given in moderate doses, it cannot allay morbid sensibility of the nerves in a higher or even an equal degree with the pure narcotic, and yet it produces its sedative effects without being attended or followed by other effects which limit or altogether forbid the employment of such substances.

The Lactucarium is properly a sedative and paregoric, a link between hydrocyanic acid and hyoscyamus, and, therefore, since it is neither more costly nor more nauseous than other narcotics, it may justly lay claim to a place in the materia medica. It is liable to spoil by keeping, and, from being insoluble in water, it forms a sediment in mixtures, which are the only objections to it.—*Lond. Med. Gaz.*, *from Rust's Magazine*, 53 Band. 1 Heft.

On the Prevention of Tubercles.—In a letter addressed to the Royal Academy of Medicine, M. Coster announces that, from certain experiments which he has made, he hopes to prove,

1. That it is possible, even in the face of predisposing causes, to prevent the development of the tubercular diathesis.

2. That even where the formation of tubercles has commenced, their progress may, in a great number of cases, be arrested.

The following are a few of the experiments upon which M. Coster has built up his hopes:

Two years ago he placed a number of dogs, rabbits, &c., in the circumstances most favourable to the development of the scrofulous diathesis. Thus, many of the unfortunate animals were shut up in dungeons, without light, incapable of moving, and exposed to a moist cold by means of wet sponges which were hung up in the cages. Some of the animals placed in these conditions, were fed on their ordinary diet; others were fed with ferruginous bread containing ½ oz. of carbonate of iron to the pound. All the former became ill, the greater part tuberculous, but not one of those fed on the bread containing iron presented a trace of tubercles.—*London Lancet*, *from Bull. de l'Acad.*, Jan. 31, 1840.